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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,106	12/24/2003	Tatyana N. Andreyushchenko	42P17815	6920

8791 7590 10/27/2005

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EXAMINER

THAI, LUAN C

ART UNIT	PAPER NUMBER
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2891

DATE MAILED: 10/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/748,106

Applicant(s)

ANDREYUSHCHENKO ET AL.

Examiner

Luan Thai

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/23/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This Office action is responsive to the Amendment filed August 16, 2005.

Claims 1-11 are pending in this application.

Claims 12-15 have been canceled.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Ngo et al. (6,225,210) as evidenced by Yang et al. (6,524,867 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 1-4 and 7-8, Ngo et al. disclose (see specifically figures 1-3) a method comprising: forming a barrier layer (12) of tantalum or tantalum nitride (Col. 2, lines 28+, Col. 3, lines 33+) on a substrate surface (e.g., a dielectric layer 10) including in at least one contact opening (11) and a field region relative to the contact opening (11), wherein the contact opening comprises a via through the dielectric layer (10) to a contact point (e.g., Col. 1, lines 35+);

depositing a conductive material (13) in the contact opening (11) to form a interconnect (Fig. 1); removing the conductive material (13) sufficient to expose the barrier layer (12) on the substrate surface (Figs. 2-3); oxidizing the material of the barrier layer (12) to create an oxidized surface (Col. 3, lines 42+). Since barrier layer (12) of tantalum is oxidized, the electrical conductivity of the tantalum barrier layer is inherently reduced as evidenced by Yang et al., Col. 1, lines 45-50.

Regarding claims 5-6 and 9-10, Ngo et al. further disclose depositing the conductive material (13) comprising electroplating (Col. 5, lines 30+) a first material (13A) and plating a second material (40) on the first material (13A) (see figure 4).

3. Claims 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshio et al. (6,534,117) as evidenced by Yang et al. (6,524,867 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 1-4, Yoshio et al. disclose (see specifically figures 1-4) a method comprising: forming a barrier layer (5) of tantalum or tantalum nitride on a surface of a substrate (1) including a dielectric layer (4) and in at least one contact opening (6) and a field region relative to the contact opening (6), wherein the contact opening comprises a via through the dielectric layer (4) to a contact point (2) (Col. 3, lines 40+); depositing a conductive material (10) in the contact opening (6) to form a interconnect (Fig. 4); removing the conductive material (10) on the substrate surface; oxidizing the material of the barrier layer to create an oxidized surface (Col. 3, lines 65+). Since barrier layer (5) of tantalum is oxidized, the electrical conductivity of the tantalum barrier layer is inherently reduced as evidenced by Yang et al., Col. 1, lines 45-50.

Regarding claims 5-6, Yoshio et al. further disclose depositing the conductive material (10) comprising electroplating a first material (7) and plating a second material (10) on the first material (7) (Col. 8, lines 25+).

Allowable Subject Matter

4. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter:

The prior art taken either singly or in combination fails to anticipate or fairly suggest the step of removing a portion of the conductive material comprising removing a portion of the conductive material within the trench, as recited in claim 11, and these method steps could not easily be conceived of even by a person skilled in the art in the light of features disclosed in Ngo et al.'s cited art.

Conclusion

6. Applicant's arguments with respect to claims 1-11 have been fully considered, but they are deemed to be moot in view of the new grounds of rejection.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action because the newly added limitations (e.g., the underlined portions) in independent claims 1 and 7 raise new issues that would require further consideration and/or search.

Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

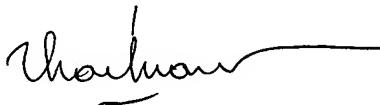
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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is 571-272-1935. The examiner can normally be reached on 6:30 AM - 5:00 PM, Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley W. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Luan Thai

Primary Examiner

Art Unit 2891

October 26, 2005